REMARKS/ARGUMENTS

Upon entry of this amendment, claims 1-34 will be pending in this application and presented for examination. Claims 11, 12, and 34 have been amended to correct minor errors or more distinctly claim the invention. Support for the amended claims can be found in the specification. No new mater has been added. Reconsideration is respectfully requested.

Applicants note with appreciation that claims 2-9, 13, 14, 16-20, 23-26, and 28-32 have been indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Objections

Claims 11 and 12 were objected to because of certain informalities. In response, Applicants have amended claims 11 and 12. Hence the objections should have been overcome.

Claim Rejections under 35 U.S.C. § 112

Claim 34 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In response, Applicants have deleted "coupled to the DTMF signal detection module" in claim 34. Hence the objections should have been overcome.

Claim Rejections under 35 U.S.C. § 103

Claims 1, 10-12, 15, 21, 22, 27 and 34 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Bertrand (U.S. Patent No. 5,150,410) in view of Tian (U.S. Patent No. 6,873,701). Applicants respectfully traverse all of the Examiner's rejections.

A. Claim 1

Bertrand and Tian, even if combined, fail to disclose or suggest all limitations of claim 1. More particularly, claim 1 recites "the dual-tone modulation frequency (DTMF) signal detection module being adapted to determine one or more DTMF tones based upon at least one

or more input CELP parameters." (emphasis added). Bertrand and Tian, even if combined, fail to disclose or suggest these claim limitations.

In the Office Action, the Examiner conceded that Bertrand does not disclose "coupling to a DTMF signal detection module." Office Action mailed May 16, 2005, page 3. But the Examiner asserted that Tian discloses a DTMF detector that determines and outputs DTMF tones based on LPC coefficients (i.e. CELP parameters). Office Action mailed May 16, 2005, pages 3-4. Specifically, Tian recites the following:

> The functions of the LPC analysis module 204 may be implemented using a suitable combination of computer instructions stored in a memory and executed by a processor. The LPC analysis module 204 may calculate a LPC synthesis filter $A_s(z)$ and generate LPC coefficients, which model the spectram of the input signal. (Tian, col. 3, lines 61-66, emphasis added).
>
> The LPC coefficients may be computed based on current small block of samples, for example, using the Levinson-Durbin algorithm. (Tian, col. 4, lines 35-37).
>
> If DTMF detection is used in a system where there is a speech-coding algorithm based on analysis by synthesis principal, then above LPC analysis module 204 can be saved since it is a part of the spceech-coding algorithm. (Tian, col. 4,, lines 38-41).

Hence the LPC analysis module 204 is only a part of the speech-coding algorithm based on analysis by synthesis principal. The LPC coefficients generated by the LPC analysis module 204 are not the CELP parameters as recited in claim 1. For example, the one or more CELP parameters are quantized. Therefore, Tian, alone or in combination with Bertrand, fails to disclose the dual-tone modulation frequency (DTMF) signal detection module being adapted to determine one or more DTMF tones based upon at least one or more input CELP parameters.

Moreover, Bertrand appears to teach away from combining with Tian. For example, Bertrand distinguishes LPC and CELP as follows.

> The proposed secure conferencing system and method of the invention employs one of the recently developed analysis-by-synthesis techniques, such as multipulse or CELP encoding, as the

> voice processing algorithm. Although these schemes are based on linear predictive coding (LPC), they do not depend on the parts of LPC that completely break down in the multiple speaker case. The excitation signal estimated by these techniques can also make up, to a certain extent, errors in the spectral envelope that are due to the LPC constraints. (Bertrand, col. 2, lines 45-55, emphasis added).
>
> LPC is based on the speech generation model shown in FIG. 2. According to this model, an all-pole linear system is excited by the sum of a periodic pulse train and noise appropriately weighted. The amplitude of the pulses and the noise depend on the speaker volume. The period of the pulse train is equal to the pitch of the speaker. In the case of multiple speakers, no single pitch exists and the true excitation consists of multiple pulse trains with different periods and amplitudes. Thus, this model is inherently a single-speaker model and can not handle multiple speakers. (Bertrand, col. 2, lines 56-66).
>
> In contrast to LPC, the analysis-by-synthesis methods do not enforce the rigid excitation scheme used by LPC. Instead, they estimate an excitation signal that minimizes the error between the original and synthetic speech according to certain selected criteria. In the single-speaker case, the analysis-by-synthesis methods yield an encoded signal which looks similar to the LPC excitation mode (a periodic pulse train). In the presence of multiple speakers, however, this excitation is not constrained to that form and, for that reason, can adequately model the speech of multiple speakers. (Bertrand, col. 2, line 67 through col. 3, line 9).
>
> Code-Excited Linear Prediction (CELP), another analysis-by-synthesis method which represents a further refinement to multipulse, is shown in FIGS. 4a and 4b. In addition to removing long term periodicities associated with the all-pole filter of LPC and multipulse, it also removes short-term periodicities with a programmable delay loop, as shown in FIG. 4a. The fact that the excitation is again estimated by an error minimization allows CELP to handle multiple speakers. (Bertrand, col. 3, lines 26-34, emphasis added).

Hence Bertrand emphasizes differences between LPC and CELP. Accordingly, it would not have been obvious for a person having ordinary skill in the art to combine Bertrand and Tian.

Claim 1 is allowable for at least the above reasons.

B. Claims 2-32

In light of the above, claims 2-32 are allowable for substantially the same reason as claim 1, and more particularly for the specific features it recites.

C. Claim 34

Bertrand and Tian, even if combined, fail to disclose or suggest all limitations of claim 34. More particularly, claim 34 recites "the CELP parameters are processed into the single set of CELP parameters without decoding the CELP parameters into the speech signal domain, without mixing the more than one voice signals into a composite signal in the speech signal domain, and without encoding the composite signal from the speech signal domain into the CELP domain." (emphasis added). Bertrand and Tian, even if combined, fail to disclose or suggest these claim limitations.

In the Office Action, the Examiner asserted that Bertrand discloses a conferencing system that mixes multiple CELP inputs from multiple CELP codecs into a single composite speech signal without decoding into the speech signal domain. Office Action mailed May 16, 2005, page 4. Specifically, Bertrand recites the following:

> The director receives the multipulse or CELP encrypted voice signal streams, decrypts them, then synthesizes a composite speech signal and uses an analysis-by-synthesis (multipulse or CELP) algorithm to compress them, encrypts the composite signal, and transmits it back to all participants. (Bertrand, col. 3, lines 52-57, emphasis added).

Hence Bertrand, alone or in combination with Tian, fails to disclose the CELP parameters are processed into the single set of CELP parameters without at least mixing the more than one voice signals into a composite signal in the speech signal domain and encoding the composite signal from the speech signal domain into the CELP domain.

Accordingly, claim 34 is allowable for at least the above reasons.

Claim Rejection under 35 U.S.C. § 102

Claim 33 was rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Tian (U.S. Patent No. 6,873,701). Applicants respectfully traverse the Examiner's rejection.

As discussed above, Tian fails to disclose "the dual-tone modulation frequency (DTMF) signal detection module being adapted to determine one or more DTMF tones based upon at least one or more input CELP parameters." (emphasis added). Hence claim 33 is allowable for at least these reasons.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

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